Abstract Submitted
for the GEC10 Meeting of
The American Physical Society

A comprehensive GD-OES and GD-MS study to elucidate the effect of trace molecular gases (O_2, H_2, and N_2) on argon-based glow discharge plasmas S. MUSHTAQ, J.C. PICKERING, E.B.M. STEERS, P. HORVATH, J.A. WHITBY — Rapid spectrochemical analysis obtained from "Grimm-type" glow discharge (GD) sources, which mainly depend on the carrier gas (usually Ar), vary if traces of molecular gases – such as O_2, H_2, and N_2 – are present. Use of clean instruments can remove external sources of trace molecular gases, but problems remain when traces are present as constituents of the sample material itself. There is hence a need to investigate, in detail, how traces of molecular gases can affect the plasma species, and cause possible errors in spectrochemical analysis. Here, we present an extensive study into the effects of trace molecular gases in an argon carrier gas. Emission spectra were generated in pure Ar plasma with a pure Fe, Ti and Cu samples, and relative line intensities measured using the Imperial College high resolution vacuum UV Fourier Transform spectrometer. These line intensities are then compared to line intensities obtained from emission spectra of Ar/O_2 and Ar/H_2 plasmas. In order to get further relevant information, glow discharge mass spectrometry (GD-MS) experiments were also taken with the pure Ar, Ar/O_2 and Ar/H_2 plasmas. Comparison of results by GD-OES and GD-MS will be presented and discussed

Sohail Mushtaq
Imperial College London

Date submitted: 12 Jun 2010 Electronic form version 1.4